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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/768,580	01/23/2001	John F. McMahon	42390.P5142D	3565

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EXAMINER

CHAMBLISS, ALONZO

ART UNIT PAPER NUMBER

2827

DATE MAILED: 12/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

### Office Action Summary

Application No.

09/768,580

Applicant(s)

MCMAHON, JOHN F.

Examiner

Alonzo Chambliss

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 08 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 28-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 28-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

#### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. Amendment E filed on 10/8/03 has been fully considered and made of record in Paper No. 15.

### ***Response to Arguments***

2. Applicant's arguments filed 10/8/03 have been fully considered but they are not persuasive.

Contrary to applicant's remarks Templeton disclose a substrate attached to a plurality of shelves. Templeton does not explicitly disclose that the substrate side that does not have the flip-chip mounted to it is mounted to the plurality of shelves. However, one skilled in the art at the time of the invention would have readily recognize flip the substrate so that the side that does not have the flip-chip mounted to it is mounted to the plurality of shelves, since by flipping the substrate the flip chip can be electrically connected to the plurality of shelves without the use of a via, which would shorter the electrical distance between devices. Therefore, it would have been obvious to incorporate a substrate so that the side that does not have the flip-chip mounted to it is mounted to the plurality of shelves with the process of Templeton, since by flipping the substrate the flip chip can be electrically connected to the plurality of shelves without the use of a via, which would shorter the electrical distance between devices. Furthermore, Ueda discloses that chip devices can be mounted facing towards the cavity or facing outside of the cavity as shown in Figs. 4 and 6.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 28, 29, 31-33, and 35-40-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Templeton, Jr. et al. (U.S. 5,874,321).

With respect to Claim 28, Templeton discloses electrically connecting a semiconductor die 704 to at least one of a plurality of shelves 702-1 - 702-N, electrically connecting a flip-chip 7033-703c to a ceramic substrate 706, and attaching the ceramic substrate 706 to one of the plurality of shelves 702-1 -702-N (see col. 9 lines 44-67 and col. 10 lines 1-58\*, Fig. 7). Templeton does not explicitly disclose that the substrate side that does not have the flip-chip mounted to it is mounted to the plurality of shelves. However, one skilled in the art at the time of the invention would have readily recognize flip the substrate so that the side that does not have the flip-chip mounted to it is mounted to the plurality of shelves, since by flipping the substrate the flip chip can be electrically connected to the plurality of shelves without the use of a via, which would shorter the electrical distance between devices. Therefore, it would have been obvious to incorporate a substrate so that the side that does not have the flip-chip mounted to it is mounted to the plurality of shelves with the process of Templeton, since by flipping the substrate the flip chip can be electrically connected to the plurality of shelves without the use of a via, which would shorter the electrical distance between devices.

With respect to Claim 29, Templeton discloses electrically connecting the ceramic substrate 706 to at least one of the plurality of shelves 702-1 - 702-N (see Fig. 7).

With respect to Claim 31, Templeton discloses wherein attaching the ceramic substrate 706 to one of the plurality of shelves 702-1 -702-N provides a lid above the semiconductor die 704 (see Fig. 7).

With respect to Claim 32, Templeton discloses electrically testing the electrically connected flip-chip 703a-703c before attaching of the ceramic substrate 706 to one of the plurality of shelves 702-1 - 702-N (see col. 10 lines 59-65).

With respect to Claim 33, Templeton discloses wherein electrically connecting the flip-chip 703a to the ceramic substrate 706 comprises electrically connecting the flip-chip 703a to the ceramic substrate 706 with solder balls (see col. 10 lines 3-10).

With respect to Claim 34, Templeton discloses disposing a seal 712 between a base of the ceramic substrate 706 and one of said plurality of shelves (i.e. 702C) to which the ceramic substrate 706 is attached (see Fig. 7).

With respect to Claims 36 and 37, Templeton discloses wherein electrically connecting the semiconductor die 301 to the at least one of a plurality of shelves comprises electrically connecting a CPU chip to the at least one of the plurality of shelves. Also, wherein electrically connecting the flip-chip 308 to the ceramic substrate 302 comprises electrically connecting a memory cache (i.e. Memory chips) flip-chip 308 to the ceramic 302 (see col. 5 lines 61-67', Figs.3A and 4).

With respect to Claim 38, Templeton discloses wherein electrically connecting the semiconductor die 704 to at least one of the plurality of shelves 702-1 - 702-N comprises electrically connecting the semiconductor die 704 to the at least one of a plurality of shelves 702-1 - 702-N with at least one bond wire (see col. 10 lines 3-10).

With respect to Claims 39 and 40, Templeton discloses including attaching the semiconductor die 301 to a heat slug 305 (i.e. heat sink), wherein the heat slug 305 is attached to at least one of a plurality of shelves (see col. 5 lines 4-15 and 38-44., Fig. 3A).

5. Claims 30 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Templeton, Jr. et al. (U.S. 5,874,321) as applied to claim 28 above, and further in view of Gaudenzi et al. (U.S. 5,313,366).

With respect to Claim 30, Templeton fails to disclose wherein electrically connecting the ceramic substrate to at least one of said plurality of shelves comprises electrically connecting the ceramic substrate to at least one of the plurality of shelves with at least one bond wire. However, Gaudenzi discloses wherein electrically connecting the ceramic substrate (i.e. chip carrier) 150 to at least one of the plurality of shelves comprises electrically connecting the ceramic substrate 150 to at least one of the plurality of shelves with at least one bond wire 152 (see col. 3 lines 46-61 and col. 4 lines 50-64; Fig. 4B). Therefore, it would have been obvious to incorporate wire bonding the substrate to a plurality of shelves with the process of Templeton, since the wire bonding would facilitate a direct electrical connection between the substrate (i.e. chip carrier) with the plurality of shelves as taught by Gaudenzi.

With respect to Claim 34, Gaudenzi discloses covering the flip chip 106 with an encapsulant 142 (see col. 4 lines 24-35; Fig. 3B).

The prior art made of record and not relied upon is cited primarily to show the process of the instant invention.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (703) 306-9143. The fax phone number for this Group is (703) 308-7722 or 7724.

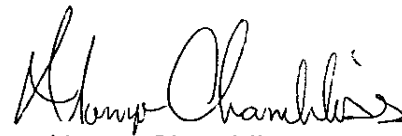
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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956.

AC/December 15, 2003

A handwritten signature in black ink, appearing to read "Alonzo Chambliss". The signature is stylized with a large initial "A" and a long, sweeping underline.

Alonzo Chambliss  
Patent Examiner  
Art Unit 2827